

Full-Scale Testing of Thermoplastic Paneling Used in Lower Portion of Aircraft Seats

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(A Comparison of Performance of OSU-Compliant Versus Non-OSU-Compliant Thermoplastics Used in the Lower Area of Aircraft Seats During a Simulated Postcrash Fire Scenario)

A research effort was undertaken by the Federal Aviation Administration to determine differences in occupant survivability during simulated postcrash fires when using FAA-compliant thermoplastic paneling located in the lower seating area compared with non-compliant paneling. Two full-scale tests were conducted in the Full-Scale Fire Test Facility at the FAA's William J. Hughes Technical Center in Atlantic City, NJ. The full-scale tests were conducted with a large external fuel fire adjacent to a B-707 narrowbody aircraft fuselage, simulating a severe but survivable accident in which the fire entered the cabin through a simulated fuselage rupture. The fuselage was instrumented with thermocouples, gas sampling lines, heat flux transducers, and smoke meters to monitor conditions during the test. The fuselage was also outfitted with 4 simulated triple seats constructed of steel angle. The upper section of the seats contained fire-hardened seat cushion bottoms and backs that met current FAA flammability requirements, while the lower area contained thermoplastic sheet on the aft and side areas. During the initial test, thermoplastic paneling that met the current FAA heat release requirements was used, while during a second test the thermoplastic paneling did not meet current requirements. The tests determined that the use of the non-compliant paneling resulted in more hazardous conditions late in the test. These conditions were determined using a Fractional Effect Dose model using the temperature and gas data collected during the tests.